

EDITORS' PREFACE

Space Science has developed so fast that it is not a simple undertaking to circumscribe its current state. Indeed, from October 1957, when Sputnik I was launched into orbit, until now, many new results have been obtained, compiled and published in thousands of specialized articles. To depict every stone in this ever growing edifice of scientific discoveries has become a formidable task. In less than a quarter of a century, it has become difficult for any individual to assimilate all that has been learnt even in the single area of solar system plasmas and fields which is the subject of this issue of *Advances in Space Research*. Therefore, it was necessary to base this broad-based review at a comparatively elementary level on contributions from many experts in space plasmas and fields. In Chapters 2 - 14 each of the contributors has given a brief but up to date survey of his own speciality. In Chapter 2, W.I. Axford described the historical background within which the magnetosphere of the Earth was discovered. Chapters 3 and 4, respectively on magnetic fields and electric fields in the magnetosphere, were prepared by W.P. Olson and C.-G. Fälthammar. Chapter 5, on waves in the magnetosphere, was contributed by D. Jones. The Chapters on low energy charged particles, on hot plasma, and on high energy charged particles were prepared respectively by C.R. Chappell (Chapter 6), T.E. Eastman and L.A. Frank (Chapter 7), and G.A. Paulikas and J.M. Blake (Chapter 8). For the descriptions of the solar wind particles (Chapter 9) and magnetic fields (Chapter 10) respectively, H. Rosenbauer and L.F. Burlaga were the contributors. A.J. Dessler contributed Chapter 11 on the magnetosphere of Jupiter and Y.C. Whang and K.I. Gringauz that on the magnetospheres of Saturn, Mercury, Venus and Mars (Chapter 12). V. Domingo has described in Chapter 13 some effects of solar wind variations on the Earth's environment, while in the same section R. Gendrin has drawn attention to the effects of solar related magnetospheric processes, especially on Man's technical devices. The issue ends with a section on perspectives and future projects as they are foreseen by D.J. Williams.

Of course, within the limited space devoted to each Chapter, the contributors could at best give only the flavour of the different subjects dealt with. Readers who desire an even shorter account of the current and future state of research in solar system plasmas and fields will find, in Chapter 1, a brief overview of the whole field with appropriate reference to each of the above mentioned Chapters. This plan for the present issue should permit anyone more interested in one special aspect to find it quickly within the wider and more general frame of "plasmas and fields in the solar system".

During the preparation, special efforts were made to simplify descriptions avoiding as much

as possible specialised technical terms, lengthy scientific equations and analyses. Therefore, the style is not that used in the specialized scientific literature, and we hope that the subject is more accessible to a wide readership without special training in physics and in mathematics.

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